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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/844,830	04/27/2001	Timothy Fries	355-A	3332

7590 08/03/2004

CIENA Corporation
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1201 Winterson Road
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EXAMINER	
BELLO, AGUSTIN	
ART UNIT	**PAPER NUMBER**
2633	20

DATE MAILED: 08/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/844,830	FRIES ET AL.	
	Examiner	Art Unit	
	Agustin Bello	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 April 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-5,7,8,10,12-15,17-23 and 25-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2-5,7,8,10,12-15,17-23 and 25-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 4/6/04 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 2-5, 7-8, 10, 12-15, 17-23, and 25-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jeong (U.S. Patent 6,393,188).

Regarding claims 12 and 25, Jeong teaches a discrete dispersion compensation module (reference numeral 40 in Figure 1) for substantially compensating for dispersion and dispersion slope (column 2 lines 38-40) at a discrete location in an optical communications network transmitting signals on multiple wavelengths (e.g. wavelength division multiplexing column 1 lines 7-12), the dispersion compensation module comprising: a first dispersion compensating fiber (DCF 1 in Figure 2) providing dispersion compensation and dispersion slope compensation (column 2 lines 38-40) at the discrete location, said first dispersion compensating fiber having a first nonzero dispersion coefficient (D_1 in Figure 2) and a first non-zero dispersion slope

coefficient(S_1 in Figure 2), a ratio of the first non-zero dispersion coefficient to the first non-zero dispersion slope coefficient being a first dispersion-to-dispersion slope ratio (column 4 lines 4-14); a second dispersion compensating fiber (DCF 2 in Figure 2) in optical communication with said first dispersion compensating fiber, said second dispersion compensating fiber having a second non-zero dispersion coefficient (D_2 in Figure 2) and a second non-zero dispersion slope coefficient (S_2 in Figure 2), a ratio of the second non-zero dispersion coefficient to the second non-zero dispersion slope coefficient being a second dispersion-to-dispersion slope ratio (column 4 lines 4-14), wherein a length of said first dispersion compensating fiber and a length said second dispersion compensating fiber are selected to compensate dispersion and to compensate dispersion slope simultaneously (column 2 lines 44-54) for the multiple wavelengths at a discrete location along a transmission path of the optical communications network, wherein said first and second dispersion compensating fibers are contained within the discrete dispersion compensating module (reference numeral 40 in Figure 1) that is located at a discrete location along the transmission path and between a multiplexer and a demultiplexer (inherent in the wavelength division multiplexing column 1 lines 7-12) of the optical communications network, wherein the length of first dispersion compensating fiber and the length of second dispersion compensating fiber are selected based on a mathematical solution (e.g. solution of Equations 6-8 in column 4) compensating dispersion in the transmission path and compensating dispersion slope in the transmission path, wherein the mathematical solution minimizes the following terms:

Dtrans * Ltrans + Ddcfl * Ldcfl + Ddcf2 Ldcf2 (Equation 7)

Ltrans * Strans + Ldcf 1 * Sdcf 1 + Ldcf2 Sdcf2 (Equation 8)

where D is dispersion coefficient, L is length and S is dispersion slope coefficient, wherein the length of first dispersion compensating fiber and the length of second dispersion compensating fiber are selected based on discrete lengths approximating the mathematical solution (as indicated by the approximate symbol in equations 6-8). Jeong differs from the claimed invention in that Jeong fails to specifically teach that the first and second dispersion-to-dispersion slope ratios are greater than a dispersion-to-dispersion slope ratio associated with the transmission path. However, Jeong teaches that more than two dispersion compensating fibers may be used in the compensating module (Figure 2), with each dispersion compensating fiber having its own dispersion-to-dispersion slope ratio. Furthermore, Jeong teaches that *at least one* of these dispersion compensating fibers has a dispersion-to-dispersion slope ratio greater than the dispersion-to-dispersion slope of the fiber. As such one skilled in the art would clearly have recognized that at least one, but possibly more than one of the dispersion compensating fibers within the compensating module could have a dispersion-to-dispersion slope ratio greater than the dispersion-to-dispersion slope ratio of the fiber. Moreover, the dispersion slope of the SMF fiber to be compensated for in the system of Jeong is unknown and can have a wide range of values. As such, the possibility exists that the exemplary two fiber compensating module disclosed by Jeong is such that the first and second dispersion-to-dispersion slope ratios are greater than a dispersion-to-dispersion slope ratio associated with the transmission path. Taking the above into consideration, it would have been obvious to one skilled in the art at the time the invention was made to select a first and second dispersion compensating fiber such that the first and second dispersion-to-dispersion slope ratios of the compensating fibers are greater than a dispersion-to-dispersion slope ratio associated with the transmission path.

Regarding claims 2 and 17, Jeong teaches that the first non-zero dispersion coefficient is different from the second non-zero dispersion coefficient(column 2 lines 44-54).

Regarding claims 3 and 18, Jeong teaches that the first non-zero dispersion slope coefficient is different from the second non-zero dispersion slope coefficient (column 2 lines 44-54).

Regarding claims 4 and 19, Jeong teaches that the transmission path (reference numeral 20 in Figure 1) is an inter-network element section of transmission fiber optically coupling the discrete dispersion compensation module (reference numeral 40 in Figure 1) and a node (reference numeral 50 in Figure 1) of the optical communications network.

Regarding claims 5 and 20, Jeong teaches that the transmission path includes a component (reference numeral 30 in Figure 1) in optical communication with the inter-network element section of transmission fiber.

Regarding claims 7 and 21, Jeong teaches that the transmission path extends between a first terminal (reference numeral 10 in Figure 1) and a second terminal (reference numeral 50 in Figure 1) to define a terminal-to-terminal path and the discrete dispersion compensation module (reference numeral 40 in Figure 1) is optically coupled to the second terminal (as seen in Figure 1) and between the multiplexer and demultiplexer (inherent in the wavelength division multiplexing column 1 lines 7-12).

Regarding claims 8 and 22, Jeong teaches that the transmission path includes a component (reference numeral 30 in Figure 1) in optical communication with the terminal-to-terminal path.

Regarding claims 10 and 23, Jeong teaches that the length of first dispersion compensating fiber and the length of second dispersion compensating fiber are selected based on a mathematical solution (e.g. solution of Equations 6-8 in column 4) compensating dispersion in the transmission path and compensating dispersion slope in the transmission path.

Regarding claims 13 and 26, Jeong teaches that the mathematical solution compensates for Nth order dispersion effects (via the coupling of N dispersion compensating fibers in the compensation module) in the transmission path, where N is greater than 2 (as seen in Figure 2), said discrete dispersion compensation module further comprising and containing N dispersion compensating fibers (as recited in claim 1), including said first and second dispersion compensating fibers (as seen in Figure 2), in optical communication with each other, each of said N dispersion compensating fiber having a non-zero dispersion coefficient and a non-zero dispersion slope coefficient, wherein respective lengths of said N dispersion compensating fibers are selected to compensate 1st through Nth order dispersion effects (via the coupling of N dispersion compensating fibers in the compensation module) for the multiple wavelengths in the transmission path (in the wavelength division multiplexed system).

Regarding claim 14 and 27, Jeong teaches that the mathematical solution includes a value (e.g. D_{smf} in Equation 7) representing dispersion introduced by components in the transmission path.

Regarding claim 15 and 28, Jeong teaches that the mathematical solution includes a value (e.g. S_{smf} in Equation 8) representing dispersion slope introduced by components in the transmission path.

Regarding claims 29 and 30, Jeong teaches that the first (e.g. 300 nm) and second (e.g. 240 nm) dispersion-to-dispersion slope ration are positive.

Response to Arguments

4. Applicant's arguments filed 4/6/04 have been fully considered but they are not persuasive. As previously discussed, Jeong teaches that *at least one* of these dispersion compensating fibers has a dispersion-to-dispersion slope ratio greater than the dispersion-to-dispersion slope of the fiber. As such one skilled in the art would clearly have recognized that at least one, but possibly more than one of the dispersion compensating fibers within the compensating module could have a dispersion-to-dispersion slope ratio greater than the dispersion-to-dispersion slope ratio of the fiber. The applicant's assertion that Jeong is concerned with compensating for the dispersion and dispersion slope of a "standard" single mode fiber is baseless, for Jeong never limits his specification or claims to a "standard" single mode fiber. As such, the dispersion slope of the SMF fiber to be compensated for in the system of Jeong is unknown and can have a wide range of values. Therefore, the possibility exists that the exemplary two fiber compensating module disclosed by Jeong is such that the first and second dispersion-to-dispersion slope ratios are greater than a dispersion-to-dispersion slope ratio associated with the transmission path.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lu, Ishikawa, Dong, Vengsarkar, Akasaka, and Danzinger teach relevant art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Agustin Bello whose telephone number is (703)308-1393. The examiner can normally be reached on M-F 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (703)305-4729. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-3900.

AB
July 25, 2004